

A Timely Plan

During its two days of meetings and discussions, the Blue Ribbon Panel on Research Training and Career Development had the opportunity to review developments in dental, oral, and craniofacial health research. The Panel read a variety of materials in advance of the meeting, heard testimony from specialists involved in scientific research training and career development, and offered their own expert views on scientific opportunities and investigator competencies. Based on that experience, the Blue Ribbon Panel concludes:

Opportunities in health-related research abound. Research discoveries are in the public good. Oral, dental, and craniofacial research is a national asset. This asset is now at risk. It is in the national interest to develop a timely plan to nurture and develop and protect this asset. NIDCR should act as a catalyst in creating this plan.

Based on their discussions, the Blue Ribbon Panel developed a series of comments and recommendations, which are presented in the pages that follow.

Endorsement of the 1997 NIDR Strategic Plan

The Blue Ribbon Panel on Research Training and Career Development enthusiastically endorsed the 1997 NIDR Strategic Plan. The Plan remains a blueprint that the Panel acknowledges as having been carefully thought out and to which they give credit.

Expansion and Diversification of NIDCR Research Training and Career Development Programs

The Panel endorsed the variety of opportunities that the Institute has developed to encourage students to pursue research careers. These programs seem flexible. The problem appears to be a lack of candidates willing to participate in the training programs. Therefore, the Panel endorsed efforts to increase the pool of candidates for careers in dental, oral, and craniofacial health research. This may involve recruiting more students at the precollege level or at the undergraduate level into research careers. It also means increasing the number of underrepresented minorities, women, and individuals with disabilities in health-related research careers.

Significant Research Opportunities in the 21st Century

It is clear from the material reviewed by the Panel that the most significant research opportunities in the coming years will involve a wider range of scientists working in collaboration to address pressing health needs. Therefore, the Panel suggested that the Institute place high priority on interdisciplinary research and training, expanded phases of functional genomic analyses, and applied research. There is evidence that oral health research has already moved in the direction of greater interdisciplinary arrangements. The Panel views the Institute as having a critical role in fostering the development of research through a strong portfolio of research training and career development that responds to these trends. Given the rapid developments in health research and potential for important advances in dental, craniofacial and oral health research, the Panel encouraged the Institute to assist dental schools in establishing and maintaining their competitiveness in an entirely reconfigured research environment.

Core Competencies

The Panel recommended that the Institute promote needed “core” competencies across all research training programs. The types of competencies that will be needed vary, but may include familiarity with molecular biology, bioengineering, biomathematics, information science, physiology, biochemistry, endocrinology, epidemiology, behavioral and social sciences; quantitative analytic skills; team/collaborative skills; ethics and bioethics training; oral and written communication skills; management skills, entrepreneurship and knowledge of technology transfer approaches.

An Implementation Plan

In addition to responding to the primary charge, the Blue Ribbon Panel also suggested an implementation plan. These suggestions are organized around four themes:

1. Diversify the NIDCR research and training portfolio,
2. Focus on the training environment,
3. Expand the mix of disciplines in dental, craniofacial, and oral health research, and
4. Adopt new strategies to promote diversity in the scientific workforce.

1. Diversify the NIDCR Research and Training Portfolio

Student debt, misperceptions about careers in research, and a *lack of mentors* remain major challenges in increasing the flow of talent into clinical research careers – including research that addresses dental, oral and craniofacial health. Estimates indicate that dental schools have less than half the faculty needed to provide a strong research environment.

Several organizations and professional societies, including AADR and AADS, have already taken steps to facilitate the flow of talent into dental, craniofacial, and oral health research.

Indeed, a number of speakers at the Blue Ribbon Panel meeting offered important insights into innovative strategies to increase the flow of talented individuals into health research.

What is needed is an expansion of the NIDCR research and training portfolio to stimulate the scientific talent base in this area. To that end, the Blue Ribbon Panel offered the following recommendations:

- Fund programs that reach grades K through 12 and colleges, to provide positive images/role models in oral health research and dentistry.
- In general, promote and enhance the image of the “clinician scientist” in dentistry.
- Work with professional organizations to link constituencies in new ways so that information about opportunities in oral health research reach more people.
- Coordinate federal interdepartmental and interagency student assistance programs for health professions education and training; foster scholarship and loan forgiveness programs.
- Provide “bridging awards” that foster research opportunities for scientists at key points in the formation of their careers.
- Develop assessment procedures that capture the range of career outcomes available to health scientists, including clinical researchers.
- Facilitate lifelong learning so that scientists in midcareer status can be retrained and become current.

2. Focus on the Training Environment

Although it is difficult to be certain about the direction that health research will take in the coming years, the Panel identified several important trends. These trends include the rise of interdisciplinary research in the health sciences, the emergence of molecular studies after a period of reductionist research in genetics, and the growing importance of applied research – including domestic and international collaborative translational and clinical research, population-based studies, epidemiology, health promotion, and health services research.

Specific competencies that will be needed include familiarity with a range of scientific specialties, as well as an ability to work cooperatively on teams, deal with ethical issues, and manage complex, interdisciplinary studies.

The Panel also learned that a research-intensive environment is essential in the preparation of skilled scientists given the anticipated direction of health-related research and training. As a result, the Blue Ribbon Panel suggests that the National Institute of Dental and Craniofacial Research:

- Place high priority on interdisciplinary research training, with an emphasis on genomics and functional genomics, and applied research.

- Be selective about awarding training grants to institutions that are research intensive, committed to interdisciplinary research and to guiding/mentoring trainees.
- Ensure that all trainees have experience with international collaborative research.

3. Expand the Mix of Disciplines in Dental, Craniofacial, and Oral Health Research

Individuals involved in NIDCR-sponsored research training and career development programs reported to the Panel that their current experiences are “valuable” but that more could be done to enhance the effectiveness of these programs.

All scientists will need to acquire new skills over the course of their careers, as well as be ready to work with individuals from new and emerging disciplines, and to serve as mentors for the next generation of researchers. More than ever, science needs individuals who know the benefits of – and have the skills necessary for -- interdisciplinary team-based research and who are able to establish and pursue domestic and global collaborations.

Based on these findings and deliberations, the Blue Ribbon Panel encourages the Institute to:

- Be inclusive rather than exclusive in research training – involve dentists, physicians, and other health professionals, and PhDs in the basic and behavioral sciences.
- Train a cadre of PhDs who have clinical interest for research careers in oral health.
- Given the trend towards translational, clinical, and population-based studies, NIDCR should place more emphasis on training programs that focus on research related to health services, prevention, health promotion, epidemiology, access, and public health.

4. Adopt New Strategies to Promote Diversity in the Scientific Workforce

Recognizing that research related to dental, oral and craniofacial research should reflect the diversity of the United States, the NIDCR has developed several programs to increase the participation of individuals from underrepresented racial and ethnic minority groups, women, and those with disabilities in research careers. These include the active support of minority supplements to research grants, NRSA short-term summer research training programs for students from underrepresented populations and co-funding of MARC programs and predoctoral fellowships for minorities and individuals with disabilities.

Programs like the Meyerhoff Scholarship Program at the University of Maryland, Baltimore County, have demonstrated that certain techniques for attracting and retaining “high achieving” minorities into research careers are effective. The Meyerhoff Program connects active researchers with students literally from their freshman year and certainly after the freshman year. These faculty work with them in laboratories, get to know them and give them a chance to feel their enthusiasm for science. Furthermore, educational outcome studies have documented the effectiveness of this program relative to the promotion of scientific careers.

Given the continuing need to promote scientific workforce diversity, the Blue Ribbon Panel urges the Institute to consider the following recommendations:

- NIDCR should establish formal liaisons and work with NIH programs, other departmental agencies and professional organizations involved in the recruitment and training of talented individuals from underrepresented groups, women, and individuals with disabilities for careers in research.
- NIDCR should explore and develop pedagogical programs with historically minority institutions that reflect those practices that have proven effective in recruiting and nurturing talented individuals into research careers.

In summary, the changes suggested by the Blue Ribbon Panel should result in the successful development of a cadre of skilled scientists who will advance oral, dental, and craniofacial health through their research in the 21st Century.